In re Patent Application of:
RAINERI ET AL.
Serial No. **Not Yet Assigned**
Filing Date: **Herewith**
_____/

In the Claims:

Please cancel Claims 1 to 6.

Please add new Claims 7 to 26.

7. A method for forming isolating structures in a silicon carbide layer, the method comprising:

forming a masking layer on first and second portions of a silicon carbide layer;

forming openings through the masking layer to expose the first portions of the silicon carbide layer;

implanting ions into the first portions of the silicon carbide layer; and

heating the silicon carbide layer to form an oxide layer thereon having first portions on the first portions of the silicon carbide layer and having second portions on the second portions of the silicon carbide layer, with the first portions of the oxide layer having a first thickness and the second portions of the oxide layer having a second thickness less than the first thickness.

8. A method according to Claim 7, further comprising:

removing the oxide layer to form isolating regions in the first portions of the silicon carbide layer; and

depositing insulation material in the isolating regions to form isolating structures.

9. A method according to Claim 7, further comprising

removing the masking layer before heating the silicon carbide layer.

Cont. Cx

10. A method according to Claim 7, wherein the ions comprise heavy ions.

11. A method according to Claim 7, wherein the ions comprise a dopant.

12. A method for forming isolating trenches for an epitaxially grown diode, the method comprising:

forming a first epitaxial layer having a first type of conductivity on a silicon carbide layer;

forming a second epitaxial layer having a second type of conductivity on the first epitaxial layer;

forming a masking layer on the second epitaxial layer;

forming openings through the masking layer to expose first portions of the second epitaxial layer;

removing the first portions of the second epitaxial layer to expose first portions of the first epitaxial layer;

implanting ions into the first portions of the first epitaxial layer;

heating the first and second epitaxial layers and the silicon carbide layer to form an oxide layer having first portions on the first portions of the first epitaxial layer and having second portions on the second epitaxial layer,

with the first portions of the oxide layer having a first thickness and the second portions of the oxide layer having a second thickness less than the first thickness; and

removing the oxide layer to form the isolating trenches in the first portions of the first and second epitaxial layers.

Cont. Cx.

13. A method according to Claim 12, further comprising depositing insulation material in the isolating trenches.

14. A method according to Claim 12, wherein the first epitaxial layer has a first thickness, and the second epitaxial layer has a second thickness less than the first thickness.

15. A method according to Claim 12, further comprising removing the masking layer before heating the first and second epitaxial layers and the silicon carbide layer.

16. A method according to Claim 12, wherein the ions comprise heavy ions.

17. A method according to Claim 12, wherein the ions comprise a dopant.

18. A method according to Claim 12, wherein the second epitaxial layer defines an anode of the diode.

19. A method for isolating an edge of an epitaxially grown diode, the method comprising:

forming a first epitaxial layer having a first type of conductivity on a silicon carbide layer;

forming a second epitaxial layer having a second type of conductivity on the first epitaxial layer;

forming a masking layer on the second epitaxial layer;

forming openings through the masking layer to expose first portions of the second epitaxial layer;

removing the first portions of the second epitaxial layer to expose first portions of the first epitaxial layer;

implanting ions into the first portions of the first epitaxial layer;

heating the first and second epitaxial layers and the silicon carbide layer to form an oxide layer having first portions on the first portions of the first epitaxial layer and having second portions on the second epitaxial layer, with the first portions of the oxide layer having a first thickness and the second portions of the oxide layer having a second thickness less than the first thickness; and

removing the oxide layer to form isolating trenches in the first portions of the first and second epitaxial layers;

forming a ring mask on a peripheral portion of the isolating trenches; and

implanting ions into the isolating trenches to form an implanted region in the first epitaxial layer that extends

across a bottom and sidewalls of the trench adjacent the ring mask for isolating the edge of the epitaxially grown diode.

20. A method according to Claim 19, further comprising:

removing the ring mask; and

heating the first and second epitaxial layers and the silicon carbide layer to form a second oxide layer on the trench and on the second epitaxial layer.

21. A method according to Claim 20, further comprising removing a portion of the second oxide layer on the second epitaxial layer.

22. A method according to Claim 19, wherein the first epitaxial layer has a first thickness, and the second epitaxial layer has a second thickness less than the first thickness.

23. A method according to Claim 19, further comprising removing the masking layer before heating the first and second epitaxial layers and the silicon carbide layer silicon carbide layer.

24. A method according to Claim 19, wherein the ions comprise heavy ions.

25. A method according to Claim 19, wherein the ions comprise a dopant.